

COMBUSTION ENGINE FOR SOLID AND LIQUID FUELS

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16. Abstract The invention deals with a combustion engine having no piston, a single cylinder, and a dual-action, that is applicable for solid and liquid fuels and propellants, and that functions according to the principle of annealing point ignition. The invention uses environmentally benign amounts of fuel and propellants to produce gas and steam pressure, and to use a simple assembly with the lowest possible consumption and constant readiness for mixing and burning. The advantage of this invention as compared to conventional combustion engines lies in lower consumption of high-quality igniting fluid in the most cost-effective manner. <p style="text-align: center;">ORIGINAL PAGE IS OF POOR QUALITY</p>			
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The invention deals with a combustion engine having no /1* piston, a single cylinder, and a dual-action, that is applicable for solid and liquid fuels and propellants, and that functions according to the principle of annealing point ignition, which is triggered by a foreign, hypergolic liquid igniting agent. The use of electricity for annealing and igniting is not absolutely necessary for normally dimensioned combustion engines. The single cylinder operation may involve a multiple cylinder application depending on casing construction.

The combustion engine in this invention consists of a block with a cylinder recessed in its middle. A partition and a gate subdivide the cylinder longitudinally in two halves creating two identical combustion chambers, in which different fuels are mixed and combusted in alternation while propellants are injected in a final step.

On the one hand power issues mechanically from the cylinder axle to which the swinging gate is attached, or it is generated by the vaporized gas directed alternately into exhaust channels and thus, according to the direction, causing thrust or rotation.

Examples of common combustion engines which operate with different fuels and propellants are the steam engine and flight turbine drives.

While the steam engine generally burns coal to produce /2 steam pressure, the flight turbine drive operates with high quality liquid fuel, as well as with injected water to increase thrust power, and with a so-called booster for reheating.

*Numbers in the margin indicate pagination in the foreign text.

These additional assemblies underline what is principally necessary to obtain optimum thrust power. These elements are not, however, combined in the drive mechanisms known to us, which is already evident from the fact that water injection is possible only for a maximum of 2.5 minutes.

Disadvantages of the steam engine include its large volume, long heating time, and excessive weight from fuel and machinery. Further disadvantages which occur with the flight turbine are the explosive effect of the liquid fuel in case of accidents, the large tank space needed, and the damaging influence of exhaust gases on the environment.

Substantial amounts of expensive, high-quality liquid fuel are consumed, while in reality this fuel should be necessary only for triggering the combustion process of cheaper materials.

The annealing head motor must be considered when comparing annealing point combustion to the processes discussed above. This motor is sturdy and processes nearly all liquid fuels. It does, however, have the disadvantage of high consumption, producing useless and damaging gases, and requiring complicated assemblies for initial firing and injection.

For this reason, the present invention intends to use environmentally benign amounts of fuel and propellants to produce gas and steam pressure, and to use a simple assembly with the lowest possible consumption and constant readiness for mixing and burning.

Ignition should occur safely and dependably even without batteries. As far as possible, the structural parts should perform several functions simultaneously, and they should be /3 as lightweight as possible. The combustion, water injection, and afterburning make it possible to use one and the same motor in this system.

Accordingly, the combustion engine in this invention is equipped with a cylindrical pressure chamber, through the middle of which runs a cylinder axle, preferably constructed as a pipe or, to fit specifications, formed by two pipe sections or bolts running through the center point of the cylinder's surfaces and positioned in the block. A swinging gate is connected to this axial mounting. When the cylinder is in the horizontal position, the gate hangs down and fills up half the cylinder's longitudinal cross section with its flat surface. A section of the gate's edge directed against the cylinder lining forms a stripping edge or toothed rim. Thus, the swinging gate can scrape small amounts of one or more cartridges of solid fuel fed to the cylinder lining from below and disperse the resulting dust particles alternately to one side or the other. The gate swings upward with the flakes building up in front of the gate, compresses the air entering from the middle of the swing area, and strikes against the filigree-coated clamps of a preferably wedge-shaped separating wall directed from above against the cylinder axle. This separating wall likewise fills up half the cylinder's longitudinal cross section and combines with the gate to divide the cylinder into two identical combustion chambers. The separating wall's core is permeable or equipped with channels and serves as the source for a liquid igniting material which releases the swinging gate's fiber-filled, preferably lens-shaped clamps whose side surfaces are recessed on both sides into the separating wall. The mixing of the flakes with the igniting material in the presence of compressed air causes ignition and combustion. This forces the gate onto the opposite side, /4 where this process is repeated. The excess gas pressure is released each time into exhaust channels located on the sides. A mixture of water and alcohol is introduced into these channels to further increase the pressure by evaporation. The filigree coating on the clamps is heated to incandescence as the alternating combustion process continues. Thus, the coatings assume the igniting function, so that no further igniting fluid needs to be used.

The advantage of this process as compared to conventional combustion engines lies in lower consumption of high-quality igniting fluid, which is used here only to induce the burning process using cheap fuel, which, likewise, as a result of the scraping process, is used in the most cost-effective manner. Batteries and magnetic igniters are not necessary, nor are starter motors, since the amount of energy required for the gate's first motion is low enough for this operation to be executed manually.

The gate, which represents the most important structural component, assumes multiple functions simultaneously. It determines the amount of solid fuel and disperses it, brings it in contact with the igniting agent, thereby compresses the air, and serves as a valve for both combustion chambers.

The solid fuel is pushed from a cartridge against one or more openings in the cylinder wall, and, in case of accidents, will not explode, as was the case with the liquid fuels used to date. The solid fuel takes up less space, and, as such, the amount of solid fuel stored onboard makes longer air flights possible.

Cartridges can be replaced in seconds, while fuel supplying and tanking with combustion engines used to date take a greater amount of time.

The drawings provide a detailed example of the invention. /5

Figure 1 shows a parallel view of the cylinder with its intake and exhaust channels. The drawing has been made without block contours to enhance clarity.

Figure 2 shows a cross section through the middle of the cylinder and the block.

Cylinder 1 is in its horizontal position in both drawings. It is situated on cartridge 2, which is standing vertically. This cartridge is pushing its solid fuel contents 3 against the lower cylinder wall.

Gate 4 is hung so that it swings on cylinder axis 5, and combines with wedge-shaped, permanently fixed partition 6 to divide cylinder 1 lengthwise into two halves. This forms two identical combustion chambers 7 and 8.

Gate 4, which is shown hanging down in the resting position, exhibits tothing 9 on the lower edge. As the gate swings back and forth this tothing first scrapes solid fuel 3 which emits from cartridge 2, and the alternatively disperses this fuel into combustion chambers 7 and 8.

Wedge-shaped partition 6 which is secured from above through block 10 against cylinder axle 5 exhibits a forked channel 11 in its middle for introducing the igniting agent. This channel forking supplies liquid igniting agent to the two clamps 12 located in the partition's sides.

Ventilation channels 13 are shown in fig. 1 on both sides against the cylinder surfaces under cylinder 5. These channels are not needed when air is blown through the cylinder axle itself.

Exhaust channels 14 turn out on both the left and right sides from the middle of the cylinder wall. Injection channels 15 supply the exhaust channels with liquid activators.

1. Combustion engine having no piston, a single cylinder, and dual-action, that is applicable for solid and liquid fuels whereby the cylinder (1) is divided by a gate (4) hung on the cylinder's inner axle and filling out half of its longitudinal cross section, and a preferably wedge-shaped, regenerating partition (6) located against the cylinder axle and which fills the cylinder's other longitudinal cross section, with the result being two combustion chambers (7 and 8). The gate (4), set in swinging motion by the pressure in the opposing chamber, alternately introduces fuel mixtures intended for combustion into the two chambers and compresses them.

2. Dual-action combustion engine of Claim 1 whereby an igniting agent is supplied to both sides of the partition (6).

3. Dual-action combustion engine of Claims 1 and 2, whereby the gate's edge has toothing (9), or else a scraping edge, with which the swinging gate scrapes off solid fuel (3) which is pressed into the cylinder in a regulated fashion as it emerges from at least one input opening.

4. Dual-action combustion engine of Claims 1 through 3 /7 whereby fireproof balls (12) which can be saturated for introducing igniting liquid are released on both sides of the partition (6).

5. Dual-action combustion engine of Claims 1 through 4 whereby the balls (12) released in the partition (6) have a filigree metal coating (16).

6. Dual-action combustion engine of Claims 1 through 5 whereby air is introduced through openings in the pipe-shaped cylinder axle (5).

7. Dual-action combustion engine of Claims 1 through 6 whereby the geometric cylinder (1) is replaced by an alternatively designed, hollow space taking the shape of a rotating body.

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Fig.1

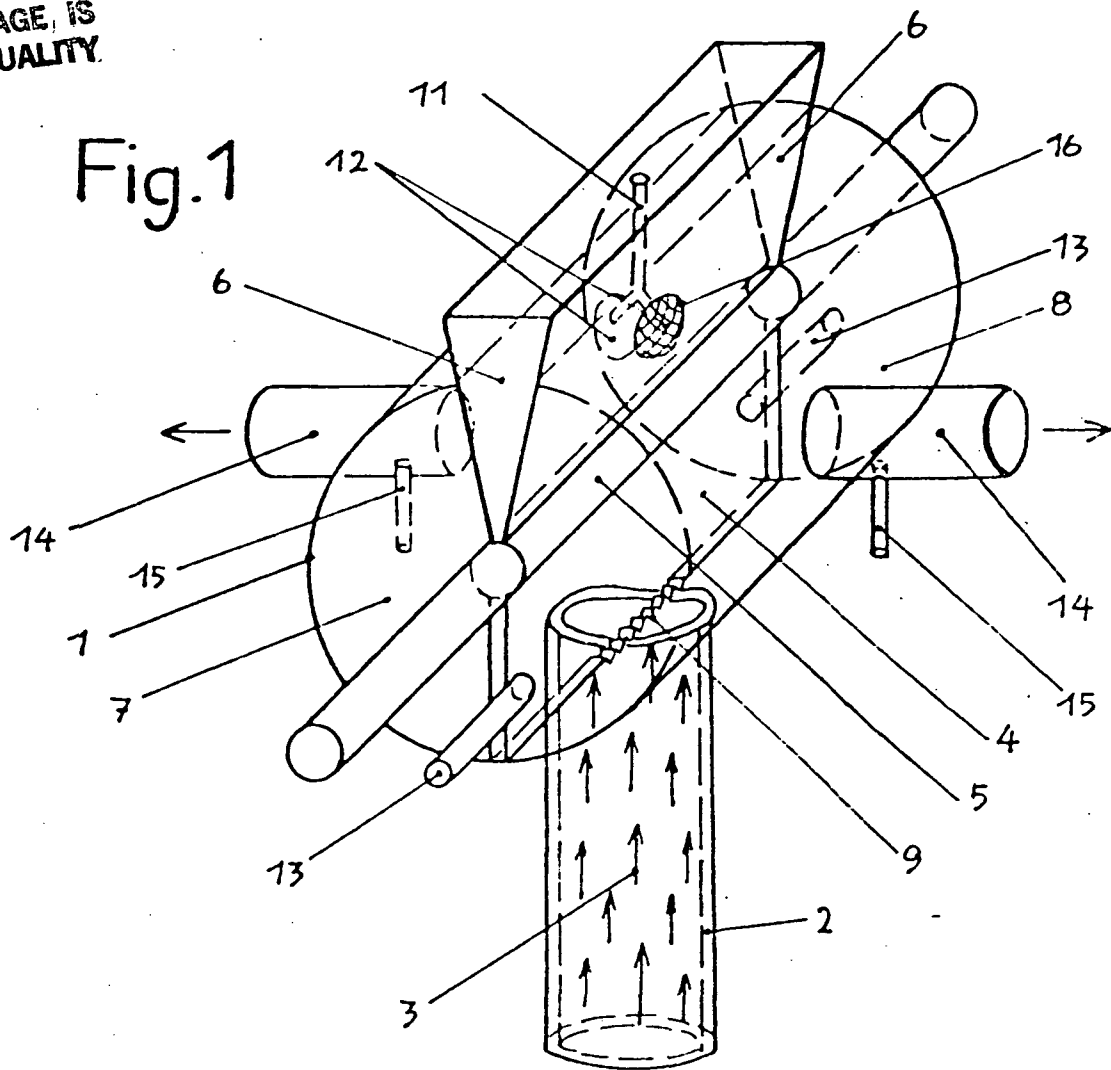


Fig.2

